

SEQUENCE LISTING

<110> Advisys  
Baylor College of Medicine

<120> SYNTHETIC MUSCLE PROMOTERS WITH ACTIVITIES EXCEEDING NATURALLY OCCURRING  
REGULATORY SEQUENCES IN CARDIAC CELLS

<130> 108328.00161 - AVSI-0027

<150> US 60/423,536  
<151> 2002-11-04

<160> 22

<170> PatentIn version 3.1

<210> 1  
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<212> DNA  
<213> artificial sequence

<220>  
<223> SRE control elements used in the promoters.

<400> 1  
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21

<210> 2  
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<220>  
<223> MEF-1 control element used in the promoters

<400> 2  
ccaacacactg ctgcctgcc

19

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<220>  
<223> MEF-2 control element used in the promoters.

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cgctctaaaa ataactccc

19

<210> 4  
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<212> DNA  
<213> artificial sequence

<220>  
<223> TEF-1 control element used in the promoters.

<400> 4  
caccatttcctt cac

13

<210> 5  
<211> 335  
<212> DNA  
<213> artificial sequence

<220>  
<223> Nucleic acid sequence of an eukaryotic promoter c5-12.

<400> 5  
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gtggggagtt attttagag cggtgaggaa ggtgggcagg cagcaggtgt tggcgctcta 120  
aaaataactc ccgggagttt ttttagagc ggaggaatgg tggacaccca aatatggcga 180  
cggttcctca cccgtcgcca tatttgggtg tccgccctcg gccggggccg cattcctggg 240  
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ctaga

<210> 6  
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<212> PRT  
<213> artificial sequence

<220>  
<223> This is the artificial sequence for GHRH (1-40)OH.

<220>  
<221> MISC\_FEATURE  
<222> (1)..(1)  
<223> Xaa at position 1 may be tyrosine, or histidine

<220>  
<221> MISC\_FEATURE  
<222> (2)..(2)  
<223> Xaa at position 2 may be alanine, valine, or isoleucine.

<220>  
<221> MISC\_FEATURE  
<222> (15)..(15)  
<223> Xaa at position 15 may be alanine, valine, or isoleucine.

<220>  
<221> MISC\_FEATURE  
<222> (27)..(27)  
<223> Xaa at position 27 may be methionine, or leucine.

<220>

<221> MISC\_FEATURE  
<222> (28)..(28)  
<223> Xaa at position 28 may be serine or asparagine.

<400> 6

Xaa Xaa Asp Ala Ile Phe Thr Asn Ser Tyr Arg Lys Val Leu Xaa Gln  
1 5 10 15

Leu Ser Ala Arg Lys Leu Leu Gln Asp Ile Xaa Xaa Arg Gln Gln Gly  
20 25 30

Glu Arg Asn Gln Glu Gln Gly Ala  
35 40

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<211> 3534  
<212> DNA  
<213> artificial sequence

<220>  
<223> Nucleic acid sequence for the HV-GHRH plasmid.

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gtgaggaatg gtggggagtt atttttagag cggtgaggaa ggtgggcagg cagcagggt 180  
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 <212> DNA  
 <213> artificial sequence

<220>  
 <223> Nucleic acid sequence for the TI-GHRH plasmid.

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		tggcgctcta	aaaataactc	ccgggagttt	tttttagagc	ggaggaatgg	tggacacccca	240
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		cattcctggg	ggccggggcgg	tgctcccgcc	cgcctcgata	aaaggctccg	ggccggggcgg	360
		cggcccacga	gctacccgga	ggagcgggag	gcccggatct	ctagaactag	tggatcccaa	420
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<210> 9  
 <211> 3534  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> Nucleic acid sequence for the TV-GHRH plasmid.

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 <212> DNA  
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<220>  
 <223> Nucleic acid sequence for the 15/27/28 GHRH plasmid.

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gatgtgctgc aaggcgattta agttggtaa cgccagggtt ttcccagtcgac	3534

<210> 11  
 <211> 2710  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> Vector with a mouse codon optimized GHRH analog sequence

<400> 11

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cggcaccatc ctcacgacac ccaaataatgg cgacgggtga ggaatggtgg ggagttat 120  
ttagagcggt gaggaagggtg ggcaggcagc aggtgttggc gctctaaaaa taactcccgg 180  
gagttat 1tt tagagcggtgaaatggcaccggat tggcgacggt tcctcaccgg 240  
tcgccccatatt tgggtgtccg ccctcgcccg gggccgcatt cctgggggccc gggcggtgct 300  
cccggccgc tcgataaaaag gctccggggc cggcgccgc ccacgagcta cccggaggag 360  
cgggaggcgc caagcgatc ccaaggccca actccccgaa coactcaggg tcctgtggac 420  
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cagccactgc agcctgcctc ccagccctcc cttaggatg cagaggcacf tggacgcct 540  
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catcatgaac aagcagggcg agaggatcca ggagcagagg gccaggctga gctgataagc 660  
ttatcggtt ggcattccctg tgaccctcc ccagtgcctc tcctggccct ggaagttgcc 720  
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caactggcagc agccactggt aacaggatta gcagagcggag gtatgttaggc ggtgtacag 1500  
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acggtcagcc cattcaccac ccagttcctc tgcaatgtca cgggttagcca gtgcaatgtc	1860
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cggcatacga gcttcagac gtgcaaacag ttccagccgt gccagaccct gatgttccctc	2040
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cagacggaaa acagctgcat cagagcaacc aatggtctgc tgtgcccagt cataaccaaa	2460
cagacgttca acccaggctg ccggagaacc tgcatacaga ccattctgtt caatcatgct	2520
aaacgatcct catcctgtct cttgatcaga tcttgatccc ctgcgccttc agatccttgg	2580
cgcaagaaa gccatccagt ttactttgca gggcttccca accttaccag agggcgcccc	2640
agctggcaat tccggttcgc ttgctgtcca taaaaccgcc cagtcttagca actgttggga	2700
agggcgatcg	2710

<210> 12  
 <211> 2713  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> Vector with a rat codon optimized GHRH analog sequence

<400> 12	
tgtaatacga ctcactatacg ggcgaattgg agctccaccg cgggtggcggc cgtccgcct	60
cgccaccatc ctcacgacac ccaaataatgg cgacgggtga ggaatggtgg ggagttat	120
ttagagcggt gaggaagggtg ggcaggcagc aggtgttggc gctctaaaaa taactcccg	180
gagttatccc tagagcggag gaatggtggc cacccaaata tggcgcacgg tccctacccg	240
tcgccccatatt tgggtgtccg ccctcggccg gggccgcatt cctgggggccc gggcggtgct	300
cccgcccccc tcgataaaaag gctccggggc cggcggcggc ccacgagcta cccggaggag	360
cgggaggcgc caagcggatc ccaaggccca actccccgaa ccactcaggg tcctgtggac	420
agctcaccta gctgccatgg ccctgtgggt gttttcgatc ctgctgaccc tgaccagcgg	480
aagccactgc agcctgcctc ccagccctcc cttcagggtg cgccggcacg ccgacgccc	540

cttcaccaggc agctacagga ggatcctggg ccagctgtac gcttaggaagc tcctgcacga 600  
gatcatgaac aggcaaggcagg gcgagaggaa ccaggagcag aggagcaggt tcaactgata 660  
agcttatcgg ggtggcatcc ctgtgacccc tccccagtgc ctctcctggc cctggaagtt 720  
gccactccag tgcccaccag cttgtccta ataaaattaa gttgcacat tttgtctgac 780  
taggtgtcct tctataatat tatgggggtgg aggggggtgg tatggagcaa ggggcaagtt 840  
gggaagacaa cctgttagggc tcgagggggg gcccggtacc agctttgtt cccttttagtg 900  
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ttcggctgcg gcgagcggta tcagctact caaaggcggt aatacggtta tccacagaat 1020  
cagggataa cgcagggaaag aacatgtgag caaaaggcca gcaaaaggcc aggaaccgta 1080  
aaaaggccgc gttgctggcg ttttccata ggctccgccc ccctgacgag catcacaaaa 1140  
atcgacgctc aagtcagagg tggcgaaacc cgacaggact ataaagatac caggcgttc 1200  
ccccttggaaat cccctcggtcg ctgcgtcctg ttccgaccct gccgcttacc ggataacctgt 1260  
ccgcctttctt cccttcggga agcgtggcgc tttctcatag ctcacgctgt aggtatctca 1320  
gttcggtgta ggtcgttcgc tccaagctgg gctgtgtgca cgaacccccc gttcagcccg 1380  
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cagagttctt gaagtgggtgg ccttaactacg gctacactag aagaacagta tttggtatct 1560  
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aaaccaccgc tggtagcggt ggttttttt tttgcaagca gcagattacg cgccggaaaaaa 1680  
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aactgcagca cacggaacac cagtggttgc cagccaaagac agacgagctg cttcatcctg 2340

cagttcattc agagcaccag acaggtcagt tttaacaaac agaactggac gaccctgtgc	2400
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aaacagacgt tcaacccagg ctgccggaga acctgcatgc agaccatcct gttcaatcat	2520
gcgaaacgat cctcatcctg tctcttgatc agatcttgat cccctgcgcc atcagatcct	2580
tggcggcaag aaagccatcc agtttacttt gcagggcttc ccaaccttac cagagggcgc	2640
cccagctggc aattccggtt cgcttgctgt ccataaaaacc gcccagtcta gcaactgttg	2700
ggaagggcga tcg	2713

<210> 13  
 <211> 2704  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> Vector with a bovine codon optimized GHRH analog sequence

<400> 13		
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cgccaccatc ctcacgacac ccaaataatgg cgacgggtga ggaatggtgg ggagttat	120	
ttagagcggt gaggaagggtg ggcaggcagc aggtgttggc gctctaaaaa taactcccgg	180	
gagttat	ttt tagagcggag gaatggtggc cacccaaata tggcgacggt tcctcacccg	240
tcgccccatatt tgggtgtccg ccctcgcccg gggccgcatt cctgggggccc gggcggtgct	300	
cccgccccgc tcgataaaaag gctccggggc cggcgccgc ccacgagcta cccggaggag	360	
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cggtcccccac ggctccctgc cctcccgcc tctgcgcatac cctcgctacg ccgacgcac	540	
cttcaccaac agtaccgcgca aggtgctcgg ccagctcagc gcccccaagg tcctgcagga	600	
catcatgaac cggcagcagg gcgagcgc当地 ccaggaggcag ggagcctgat aagtttatcg	660	
gggtggcatc cctgtgaccc ctccccagtg cctctctgg ccctggaaagt tgccactcca	720	
gtgccacca gccttgtcct aataaaaatta agttgcatca ttttgtctga cttaggtgtcc	780	
ttctataata ttatggggtg gaggggggtg gtatggagca agggggcaagt tggaaagaca	840	
acctgttaggg ctcgaggggg ggcccggtac cagctttgt tcccttttagt gagggtaat	900	
ttcgagctt gtcctccgt tcctcgctca ctgactcgct gogctcggtc gttcggtgc	960	
ggcgagcggt atcagctcac tcaaaggcgg taatacggtt atccacagaa tcaggggata	1020	
acgcaggaaa gaacatgtga gcaaaaggcc agcaaaaggc caggaaccgt aaaaaggccg	1080	

cgttgctggc	gttttccat	aggctccgcc	cccctgacga	gcatcacaaa	aatcgacgct	1140
caagtcagag	gtggcgaaac	ccgacaggac	tataaagata	ccaggcggtt	ccccctggaa	1200
gctccctcggt	gcgcctctcct	gttccgaccc	tgccgcttac	cggatacctg	tccgccttcc	1260
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ccttatccgg	taactatcgt	cttgagtcca	acccggtaag	acacgactta	tcgccactgg	1440
cagcagccac	tggttaacagg	attagcagag	cgaggtatgt	aggcggtgct	acagagttct	1500
tgaagtggtg	gcctaactac	ggctacacta	gaagaacagt	atttggtatac	tgcgcctctgc	1560
tgaagccagt	taccttcgga	aaaagagttg	gtagcttttg	atccggcaaa	caaaccaccc	1620
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gaaagccatc	cagtttactt	tgcagggctt	cccaacctta	ccagagggcg	ccccagctgg	2640
caattccggt	tcgcttgctg	tccataaaaac	cgcccagtt	agcaactgtt	ggaaagggcg	2700
atcg						2704

<210> 14  
<211> 2704  
<212> DNA

<213> artificial sequence

<220>

<223> Vector with a ovine codon optimized GHRH analog sequence

<400> 14

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ttagagcggt	gaggaagggtg	ggcaggcagc	aggtgttggc	gctctaaaaa	taactcccgg	180
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cgggaggcgc	caagcggatc	ccaaggccca	actccccgaa	ccactcaggg	tcctgtggac	420
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tgaagtgg	gcctaactac	ggctacacta	gaagaacagt	atttggt	tgcgtctgc	1560
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gaaagccatc cagtttactt tgccaggctt cccaaacctt ccagagggcg ccccaagctgg	2640
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atcg	2704

<210> 15  
 <211> 2713  
 <212> DNA  
 <213> artificial sequence

<220>  
 <223> Vector with a chicken codon optimized GHRH analog sequence

<400> 15	
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tttagagcggt gaggaagggtg ggcaggcagc aggtgttggc gctctaaaaa taactcccgg	180
gagttatccc tagagcggag gaatggtggc cacccaaata tggcgacggc tcctcaccgg	240
tcgccatatt tgggtgtccg ccctcgcccg gggccgcatt cctggggggcc gggcggtgt	300
cccgcccgcc tcgataaaaag gctccggggc cggcggcggc ccacgagcta cccggaggag	360

cgggaggcgcaagcggatccaaaggccaaactccccaa ccactcaggg tcctgtggac 420  
agtcaccta gctgccatgg ccctgtgggt gttcttgc tgctgaccc tgacccccc 480  
aagccactgc agcctgccac ccagccacc cttccgcgtc aggccacg ccgacggcat 540  
cttcagcaag gcctaccgca agtcctggg ccagctgagc gcacgcaact acctgcacag 600  
cctgatggcc aagcgcgtgg gcagcggact gggagacgag gccagcccc tgagctgata 660  
agcttatcg ggtggcatcc ctgtgacccccc tccccagtgc ctctcctggc cctggaaattt 720  
gccactccag tgcccaccag cttgtccata ataaaattaa gttgcatcat tttgtctgac 780  
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gggaagacaa cctgttagggc tcgagggggg gccccgtacc agctttgtt ccctttagtg 900  
agggttaatt tcgagcttgg tcttcgctt cctcgctcac tgactcgctg cgctcggtcg 960  
ttcggctgcg gcgagcggta tcagctact caaaggcggt aatacggta tccacagaat 1020  
caggggataa cgcagggaaag aacatgtgag caaaaggcca gcaaaaggcc aggaaccgta 1080  
aaaaggccgc gttgctggcg ttttccata ggctccgccc ccctgacgag catcacaaaa 1140  
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gttcgggtgtaa ggtcggttcgc tccaaagctgg gctgtgtgca cgaacccccc gttcagcccg 1380  
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cgccactggc agcagccact ggtAACAGGA ttagcagagc gaggtatgtt ggcgggtgtca 1500  
cagagttctt gaagtgggtgg cctaaactacg gctacactag aagaacagta tttggtatct 1560  
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gaaacggtca gcccattcac caccaggatcc ctctgcaatg tcacgggttag ccagtgcata 1860  
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cattgcatca gccatgatac aaactttctc tgccggagcc aggtgagaag acagcaggc 2220  
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aactgcagca cacggaacac cagtggttgc cagccaaagac agacgagctg cttcatcctg 2340  
cagttcattc agagcaccag acaggtcagt tttaacaaac agaactggac gaccctgtgc 2400  
agacagacgg aaaacagctg catcagagca accaatggtc tgctgtgcc agtcataacc 2460  
aaacagacgt tcaacccagg ctgcggaga acctgcatgc agaccatcct gttcaatcat 2520  
gcgaaacgt cctcatcctg tcttttgatc agatcttgc cccctgcgc atcagatcct 2580  
tggcgcaag aaagccatcc agtttacttt gcagggcttc ccaaccttac cagagggcgc 2640  
cccagctggc aattccgggt cgcttgctgt ccataaaaacc gcccagtcta gcaactgttg 2700  
ggaagggcga tcg 2713

<210> 16  
<211> 382  
<212> DNA  
<213> artificial sequence

<220>  
<223> This is the synthetic promoter c1-26.

<400> 16  
ggcggccgag ggcggcgaaaa cagggcggcgt gtgttggcac cattcctcac cgctctaaaa 60  
ataactcccc tgaggaatgg tgccgtcgcc atatttgggt gtcgacacccc aaatatggcg 120  
acgggtgagg aatggtgggc aggtagcagg tggtggaca cccaaatatg ggcacggcca 180  
acacccgtcg cctgccggaa gttatttta gagcggggag ttattttag agcggtgagg 240  
aatggtggac acccaaataat ggcacggcc gggccgcata tcctgggggc cggccgggtgc 300  
tccccccgc ctcgataaaaa ggctccgggg ccggcggcgg cccacgagct accccggagga 360  
gcgggaggcgc ccaagctcta ga 382

<210> 17  
<211> 218  
<212> DNA  
<213> artificial sequence

<220>  
<223> This is the synthetic promoter sequence for c2-26.

<400> 17  
cggccgtcgcatatttggg tgtccgtct aaaaataact cccgacacccc aaatatggcg 60  
acggggcagg cagcaggtgt tgggacaccc aaatatggcg acggccgggg ccgcattcct 120  
ggggccgggg cggtgctccc gccccctcg ataaaaggct ccggggccgg cggccggccca 180

cgagctaccc ggaggagcgg gaggcgccaa gctctaga

<210> 18  
<211> 230  
<212> DNA  
<213> artificial sequence

<220>  
<223> This is the synthetic sequence for c2-27.

<400> 18		
cggccgtcgc catatttggg tgcggcagg cagcagggtgt tggcaccatt cctcacccgt		60
cgccatattt ggggtgcggc aggcagcagt gttgggacac ccaaataatgg cgacggccgg		120
ggccgcattc ctggggggccg ggcggtgctc ccggccgcct cgataaaaagg ctccggggcc		180
ggcggcggcc cacgagctac ccggaggagc gggaggcgcc aagctctaga		230

<210> 19  
<211> 231  
<212> DNA  
<213> artificial sequence

<220>  
<223> This is the synthetic promoter for c5-5.

<400> 19		
cggccgtccg ccctcgggac acccaaataat ggcgacgggt gaggaatggc gcaccattcc		60
tcaacggagt tattttttaga gcggtgagga atgggtggaca cccaaataatg ggcgacggccg		120
ggccgcatt cctgggggcc gggcggtgct ccggccgcct tcgataaaaag gtcgggggc		180
cgccggcggc ccacgagcta cccggaggag cgggaggcgcc caagctctag a		231

<210> 20  
<211> 255  
<212> DNA  
<213> artificial sequence

<220>  
<223> This is the synthetic promoter for c6-5.

<400> 20		
cggccgtcgc catatttggg tgcgtccaaaca cctgctgcct gccccgtcgc catatgggt		60
gtcggcaggc agcagggtgtt ggccaacacc tgctgcctgc cgggagttat ttttagagcg		120
gacacccaaa tatggcgacg gccggggccg cattcctggg ggccggggccg tgctccgc		180
cgcctcgata aaaggctccg gggccggcg gggcccacga gctacccgga ggagcggag		240
gcgccaagct ctaga		255

<210> 21

<211> 283  
<212> DNA  
<213> artificial sequence

<220>  
<223> This is the synthetic promoter for c6-16.

<400> 21  
cggccgtcgc catatttggg tgtccgctct aaaaataact cccccaacac ctgctgcctg 60  
ccccgtcgcc atatttgggt gtcggcaggc agcagggttt ggccaacacc tgctgcctgc 120  
cccaacacct gctgcctgcc ccgtcgccat atttggtgtc cgccctcgcc cggggccgca 180  
ttcctggggg ccgggcggtg ctcccggccg cctcgataaa aggctccggg gccggcggcg 240  
gcccacgagc taccggagg agcgggaggc gccaagctct aga 283

<210> 22  
<211> 263  
<212> DNA  
<213> artificial sequence

<220>  
<223> This is the synthetic promoter for c6-39.

<400> 22  
cggccgtccg ccctcgaaaa agttatttt agagcgccaa cacctgctgc ctgccccgtc 60  
gccatatttgc ggtgtcgca ggcagcagggt gttggggag ttattttag agcggcgatcg 120  
ccatatttgg gtgtcccgag ggccggacggc cggggccgca ttccctggggg ccgggcggtg 180  
ctcccgcccg cctcgataaa aggctccggg gccggcggcg gcccacgagc taccggagg 240  
agcgggaggc gccaagctct aga 263